I claim:

1. A receiver for receiving and efficiently separating a composite 3-G wireless communication signal into its constituent base-band components, wherein said receiver combines multiple processing tasks of a conventional receiver in two entities comprising an equal-ripple linear phase recursive filter channelizer and an equal-ripple linear recursive interpolator, and the channelizer entity performs the processing required for multiple channels in a single device.

2. A receiver as claimed in claim 1 wherein the tasks of spectral translation, of bandwidth reduction, and of interpolation to change sample rate by a rational ratio are embedded in a resampling polyphase filter bank, and the single polyphase filter can operate in a non-resampling mode so that the sample rate change is performed in the post channelizer interpolator, the single polyphase filter also operates in a resampling mode so that one part of the sample rate change is performed in the channelizer, and another pat is performed in the post channelizer interpolator.

3. A receiver as claimed in claim 1 comprising moving the input heterodynes into and through the filtering operation so that the spectral translations occur after the filtering to permit a single filter to service multiple channels.

4. A method for constructing overlapped spectral bands in a polyphase filter bank comprising the step of overlapping bands to permit undistorted access to signals with spectral content located at band edges of a channelizer that does not support overlapped spectra.

5. A method of cascading polyphase filters to effect an initial channelization comprising the steps of applying a first layer of translation, bandwidth reduction, and sample rate change, and applying a second layer of translation, bandwidth reduction, and sample rate change.